

POTENTIALITY OF SUSTAINABLE LANDSCAPES IN CHANGING DHAKA

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ABSTRACT

Dhaka has experienced excessive growth escorted by rapid urbanization. The Urbanization phases of Dhaka have developed at different speeds and period. It became one of the fundamental characteristics of the city. Physical infrastructures are growing day by day with the swiftness of rapid urbanization. Thus the landscape has been experiencing a continuous change. It revealed that most of the physical infrastructures, including landscapes did not follow the characteristics of healthy environment better to demonstrate as a sustainable approach. This paper illustrates the characteristics on the landscape development in Dhaka city and its possible outcome.

KEYWORDS: Dhaka, F A R, Sustainable Landscape

INTRODUCTION

The Landscape of Dhaka has been undergoing with rapid changes since becoming the capital of East Pakistan in 1947. The city commenced to encroach northwards mostly because of the availability of higher lands. In addition, during this period the city adopted the western concept of sites and service's scheme. It is better to refer to the plot allocation scheme. Later in 1950s, the scheme became the key instrument in the development of the master plan of the city. Under this scheme before the birth of Bangladesh, the city has been introduced with different model towns comprising of basic grid iron patterns with small plots (Kabir & Parolin, 2012). The fundamental idea of these model towns was to create a satellite city, but the current scenario is totally opposite and the city developed as a mega city. Thus the opportunity of having a sustainable landscape had been limited before the country was born.

WHERE DHAKA IS HEADING?

The greater Dhaka in the 1960s experienced 80% of non-urban areas, which included vegetation, open spaces, wetlands and cultivated lands. However, later the situation worsened. As a result, the percentage reduced to 40% by 2005 due to rapid urbanization (Zaman & Laing, 2013). Moreover, the city itself experienced 90% of urban development during the period (Islam 2006; Kabir & Parolin, 2012). In addition to this, according to Kothin (2013) in Forbes Magazine, the population of Dhaka reached to 14 million with 115200 people per square mile, marking its way to number one densest mega city around the world.

Now the question is if we know "where we are heading" and "how we are heading?" The answer is not very simple. According to Antrop (2004), the characteristics of urbanized landscapes are multifunctional, complex and highly dynamic. The relationship between the inhabitant and their environment is changing every day. Due to corruption, political influence and lack of proper inspiration, the existing planning regulation wasn't able to exercise correctly (Khan & Mahmud, 2008). Furthermore, the previous planning regulation wasn't sufficient to provide a healthy environment to such

a high density city. As it has been mentioned before, the city has adopted the western concept of urbanization without considering the heritage and culture, interaction between nature and society and thus, the existing planning system proved inadequate as an approach to satisfy the high density as well as to provide sustainable landscapes. Satellite views of Google's earth from different parts of Dhaka (figure 1) show the developments of this city that clearly answers this question.



Figure 1: Satellite Views of Google's Earth from Different Parts of Dhaka

A DEVELOPMENT MANAGEMENT TOOL

To overcome the crisis, the introduction of Building Construction Rules, 2008 is highly appreciable. The concept of Floor Area Ratio (FAR) has been adopted. This rule seeks to control urban development plot by plot and case by case, especially on “setbacks”, “site coverage”, “land use” of that particular plot (Zaman & Laing, 2013). The restriction on building height that existed before has been eliminated, thus creating provision for tall buildings with better landscapes. So theoretically, this tool is capable of solving the problems of both high density, and of sustainable landscape.

SUSTAINABLE LANDSCAPE

Sustainable landscape is very general concept and difficult to apply in practical work. It might be a counter statement to a basic definition of landscape (Antrop, 2006). Moreover, Antrop mentioned it might not refer to any particular landscape. In Addition, it is a type of landscape design that concern planning and design of outdoor space where ecology, correct policy, social and economic aspects of sustainability are considered. (Sustainable landscape, 2015)

Ashraf & Islam (2009) in an online magazine forum pointed out that,

Dhaka is basically being built/killed in two ways: by developers and builders whose only concern is maximum economic profit and who could care less about spearheading an environmental and social degradation; and by

designated policy-makers whose myopic and miserly visions do not go beyond making regulations and land divisions, and hold no answer to the complexity of the urban landscape.

Now the question is how to recover the heritage of our city. The landscape development is essential for any healthy city. The quality of the city is vastly influenced by its Landscape development. Thus the challenge for landscape and urban planners is to predict social, economic and environmental changes and work jointly to ensure sustainability (Seabrook, et al., 2011). Traditional and Contemporary knowledge should be merged in order to develop the new idea of sustainable landscapes. Palang, et al. (2011) stressed about this and according to them in landscape and urban planning the importance of past landscape, i.e. heritage of the landscape has been forced. However, it is important to remark how this knowledge can be identified and put to use in landscape planning and management.

BEGINNING OF THE FUTURE

Floor area ratio (FAR) is a common tool for many countries. To satisfy the urbanization rate and land scarcity, the city has adopted high standards compare to other cities in the world (Khan & Mahmud, 2008). Theoretically, the tool has a wide range of ability to create a better city environment, including sustainable landscapes. However, is it true for the existing land condition where the city already has developed with a small plot division from the last century? The main idea of these new Building Construction Rules, 2008 is to permit floor space as per the plot size. This means the city will be benefited wherever plots size are bigger compared to smaller plot areas.

FAR AS A NEW HOPE

Usually in Dhaka, the popular plot sizes (figure 2) vary from three Katha (201 meter) to five Katha (335 meter). Very few percentages are less than three Katha and more than five Katha. The impact of FAR is different depending on plot size. The research in this paper will conduct with five Katha plot that stand between this ranges

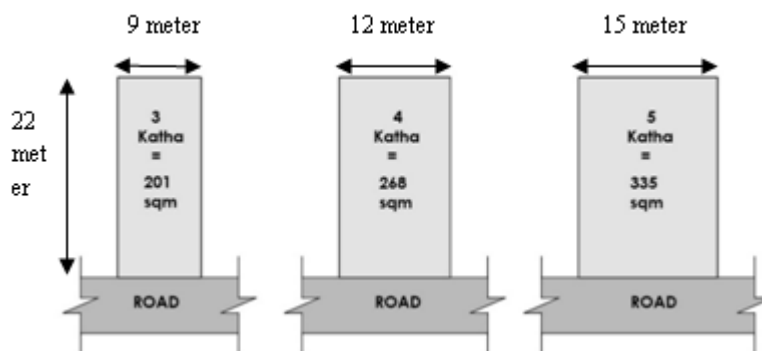


Figure 2: Popular Plot Sizes in Dhaka

Before the introduction of FAR the individual plot has experienced the development in such a way, that the whole site was allowed to build except very few spaces for setback. The result in different plots can be found as follows:

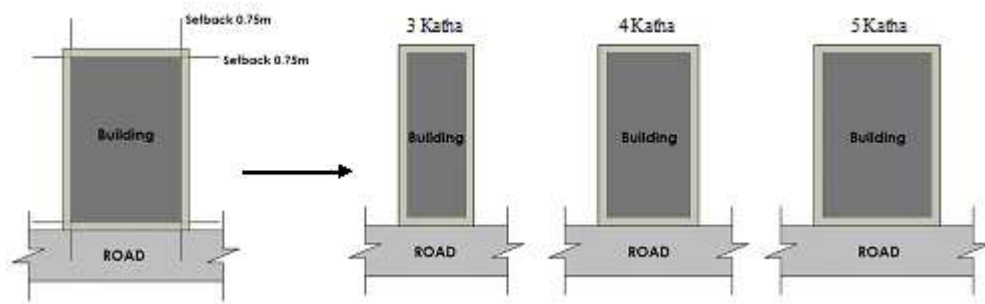


Figure 3: Conventional Way of Building Setback

The maximum building height was fixed to six storied. The consequence in an area was then as shown in figure 4 & 5

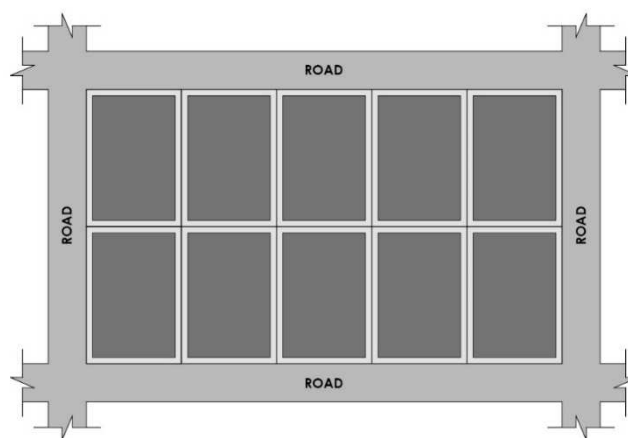


Figure 4: Conventional way of Building Construction (In Plan)

The new tool FAR has been introduced to maintain mandatory open spaces (Zaman & Laing, 2013). For example, in a residential area, maximum land utilization can be up to 67.5%. The rest is dedicated spaces for setback, open spaces etc.. However, for bigger plots this percentage become less but with a higher value of FAR, which means greater opportunity for open spaces to create healthy environment.



Figure 5: Conventional Way of Building Construction (In Elevation)

New tools create opportunities of more livable and uncovered spaces through flexibility of design as the height restriction has been eliminated (Khan & Mahmud, 2008)

An analysis has been done for better understanding of the concept. The investigation carried out with five Katha, which is the most popular among the plot's sizes. Later, the analysis has been placed to a real site formulated with many five Katha plots to feel the effect of this tool in reality. In addition, the assumption is very important to understand for the relationship between the landscape and built form.

According to Building Construction Rules, 2008, two buildings with same FAR at the similar site might have very

different appearances. It depends on setbacks, building heights and its placement on the site.

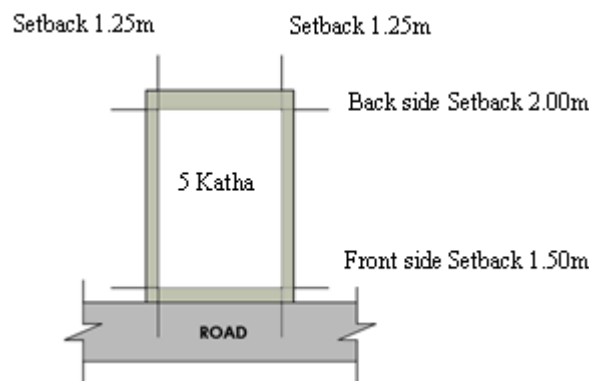


Figure 6: Min Setback on Each Side for 5 Katha Plot from Building Construction Rules, 2008

According to Building Construction Rules, 2008 FAR is 3.5 for five Katha (335 sqm) plot. Maximum ground coverage can be achieved 62.5%. Total floor area in this plot can be $\text{FAR} \times \text{plot size}$ ($3.5 \times 335 \text{ sqm}$) = 1172.5 sqm. If the maximum ground coverage ($62.5 \times 335 = 209.37 \text{ sqm}$) is selected for the design, then the building height can be seven storey including parking in the ground floor.

This ground coverage can be achieved in several ways. Some of the options have been mentioned bellow.

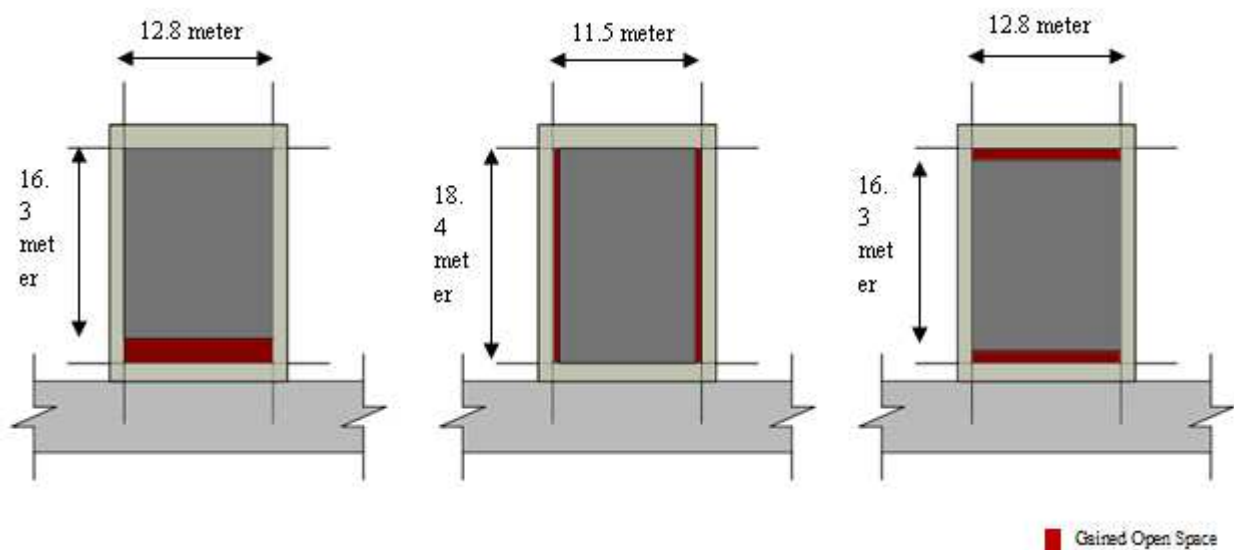


Figure 7: Options for 62.5% Ground Coverage

The red color in the diagram indicates the open space that has been gained from the conventional way of designing.

Another calculation has been made with a maximum ground coverage of 50%. The idea is to understand the context in different scenario. Thus in the case of 50% ground coverage (167.5 sqm) the building height increases to eight storey including parking area in the ground floor.

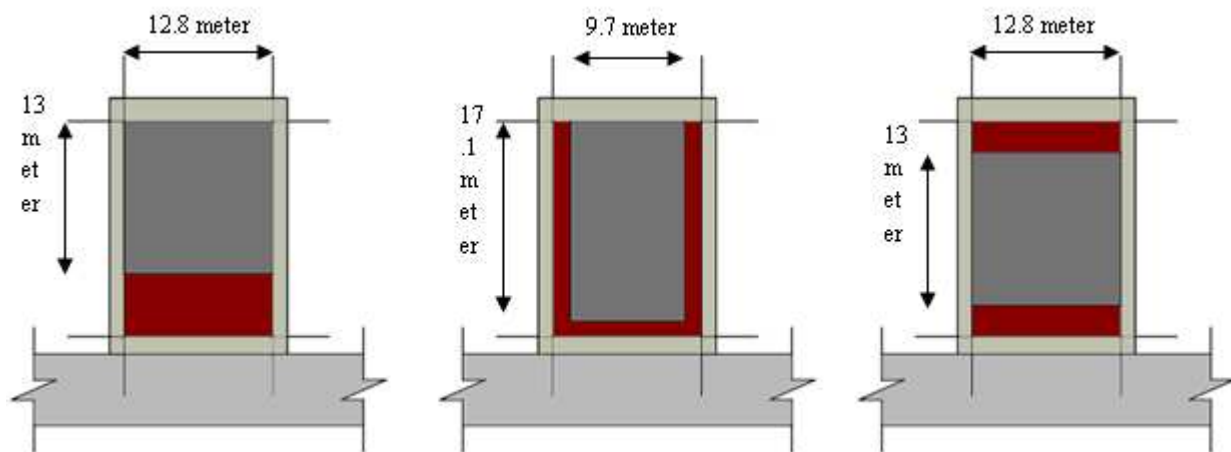


Figure 8: Options for 50% Ground Coverage

FINDINGS

Gained open spaced has been increased from the previous one. However, is it sufficient to hope for the sustainable landscape? Is the city progressing in the right direction? A further study is carried out to understand what can be achieved in the city by using the tool. A simple site (figure 9) has been selected beside newly developed Hatirjheel Lake and Tejgaon Industrial area. The result of the study will be the same for any area. However, the site has been chosen because of the rapid development that has been taken place in the area after the inauguration of the lake in 2013. Developer and landowner started to demolish and rebuild buildings because of changed market conditions. As new development is taking place, it is the crucial moment to understand the ability of the FAR in the current land organization of Dhaka for aiming for sustainable development.

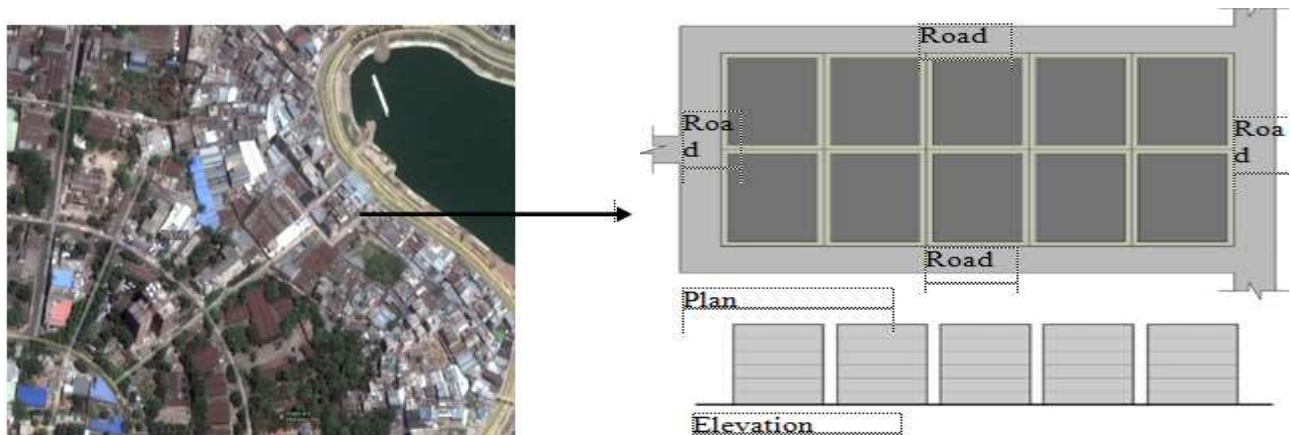


Figure 9: Building Constructed with the Conventional Way of Design

Joshi & Kono (2009) mentioned, “Developers demolish and rebuild buildings after a certain period because of increasing maintenance costs and because of changing market conditions, particularly those related to floor rent.”

The figure 9 shows how it has been constructed with the former building construction rules. Furthermore, the result that could achieve after replacing the above situation with the hypothesis of the new tool “FAR” has been shown in figure 10.

Theoretically, the green space increased from the conventional way of designing. However, practically the result is not as satisfactory to reach the level of healthy living environment. It is also not sufficient enough to accommodate the higher rate of population as the building height increased slightly from the conventional way of construction. Therefore to achieve satisfactory level of sustainable development with landscape, the present technique of applying FAR is not convincing.

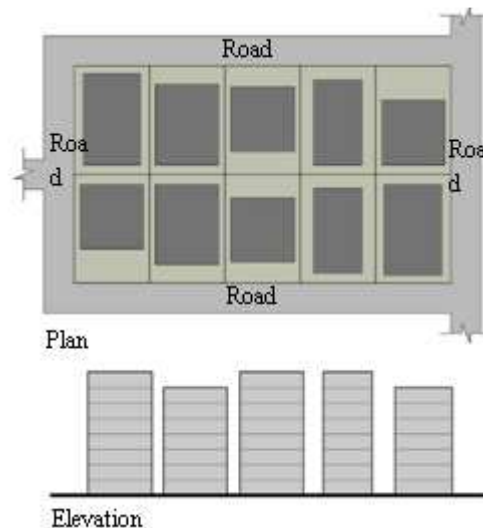


Figure 10: Result after Implementation of FAR

Such Landscape changes will be seen as a threat, a negative development, because the current modifications are characterized by the loss of diversity of, unity and identity of the traditional landscapes (Antrop, 2005).

Assumption of picking the whole site as a one plot has been taken to achieve the best outcome of the FAR. According to Building Construction Rules 2008, the FAR is higher for bigger plots. In this case, the site area become 3350 sqm, the required FAR is now 6 and maximum ground coverage is 50%. So, by assuming the whole site as one plot the FAR increased dramatically. The total floor area of current situation will be $(3350 \times 6) = 20100$ sqm, which are far greater than what can be achieved from ten small five Katha plots $(1172.5 \times 10 = 11725$ sqm). The amount is almost double. Moreover, the green space becomes unified, which allows the implementation of sustainable landscape. In this situation, the maximum ground coverage can be 1675 sqm with a minimum building height of 13 stored with parking area. The building height is flexible in relation with the ground coverage.

In these circumstances, the situation can be as follows:

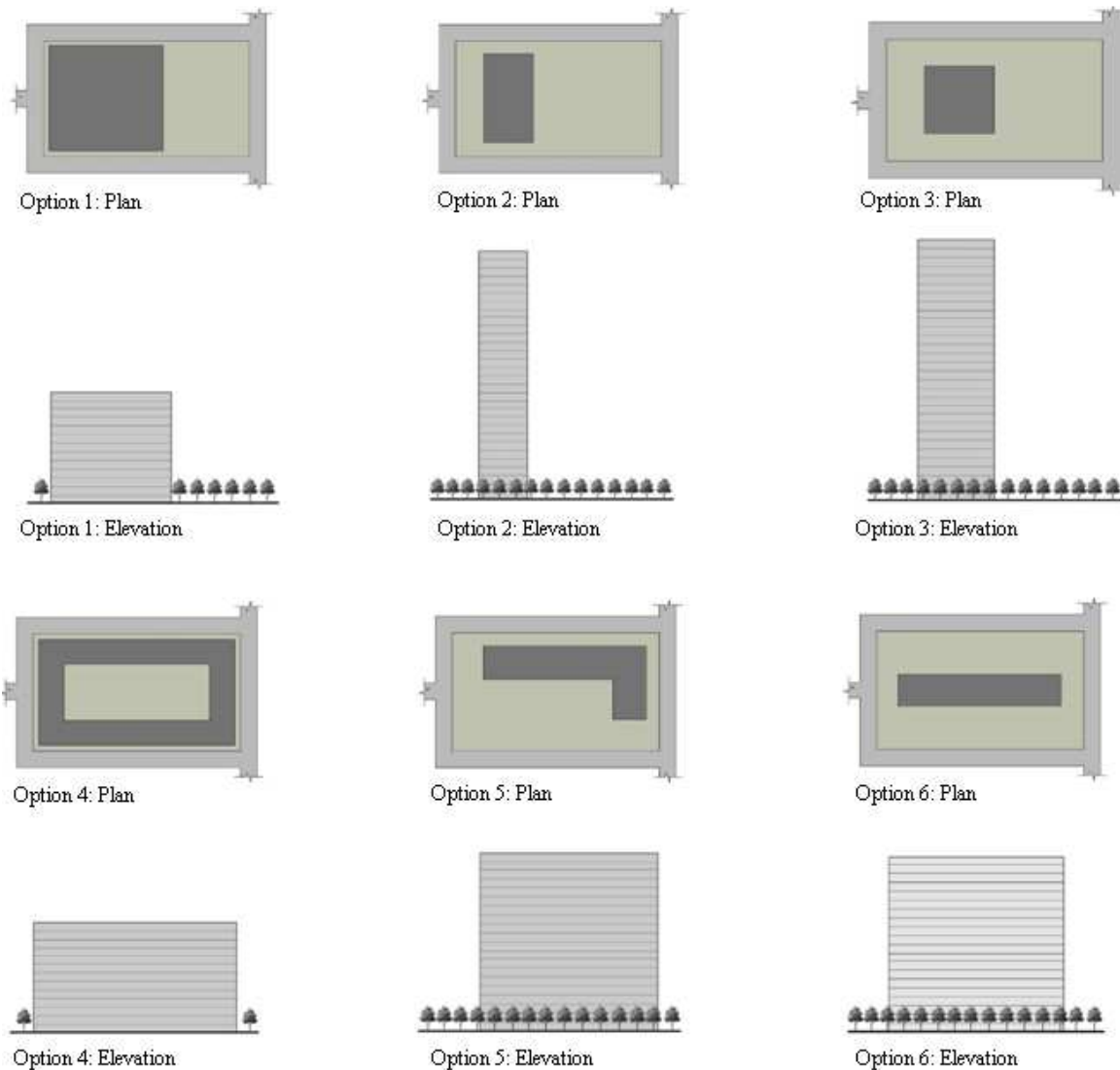


Figure 11: Several Options of Sustainable Development

Hence the relationship between the building and open spaces changed dramatically. The result strengthens the idea of Steiner (2011) that landscape should be an essential building block for a city design. Therefore, it can reduce the left-over unused open spaces from the conventional way of design. Further, the city may require some additional tools to manage future development.

WHAT'S NEXT?

The challenge is now how to achieve such a goal? What methods and policy should researchers, planners and policy makers consider? Planners and policy makers are in growing need of new significant data and scientific knowledge (Antrop, 2004). Contemporary and Traditional knowledge should be merged in order to develop the concept of sustainable landscape.

Antrop (2004) stated that landscape become on the political agenda currently. Building developer and private land owners are mainly focused on profit making objectives. They often disagree with planners, architects, environmentalists and other relevant professionals regarding the behavior of public interest from the development. (haque & Asami, 2014).

CONCLUSIONS

The challenge for landscape and urban planners is to predict social, economic and environmental changes and contribute together to ensure sustainability (Seabrook, et al., 2011). Building Construction Rules, 2008 has encouraged unification of the smaller plots to larger plots by allowing higher FAR to them. However, in reality, the landowners are not always willing to do that. The policy is not enough to convince and encourage developers and landowners, instead the government should approach a more practical solution, and several convincing policies must be introduced in order to force the new development to combine the plots together for achieving sustainable landscape. Moreover, innovative tools are also needed to monitor the progress of the development in the city and its landscape. The overall approach must be benefited to researcher, planners, politicians, citizens and stake-holder.

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